

CLAIMS

1. A card stack reader comprising:
an imaging unit reading an image from a peripheral side
5 portion of a stack of cards, each card having a read code along a
peripheral side edge thereof, the read code identifying the card; and
a code recognizing unit recognizing the read code of each card
from the image read by the imaging unit.
- 10 2. A card stack reader according to claim 1 wherein the read
code is printed on a surface of each card at the peripheral side edge
thereof.
- 15 3. A card stack reader according to claim 1 wherein the read
code is recorded to each card with a fluorescent material, and the
card stack reader includes a light irradiation unit emitting an excited
light to the peripheral side edge of each card, such that a fluorescent
light is generated from the peripheral side edge of the card that is
irradiated with the excited light.
- 20 4. A card stack reader according to claim 3 wherein the card
stack reader includes a first filter provided at a front portion of the
imaging unit, the first filter cutting off the excited light from the
light irradiation unit.
- 25 5. A card stack reader according to claim 3 wherein the card
stack reader includes a second filter provided at a front portion of
the imaging unit, the second filter cutting off a blue light from the
light irradiation unit.
- 30 6. A card which is read by a card stack reader of claim 3
wherein the read code is recorded to the card with a fluorescent
material that is colorless under a visible light.

7. A card which is read by a card stack reader of claim 3 wherein the read code is recorded to the card with a plurality of fluorescent materials that generate different color light rays by irradiation with an excited light.

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8. A card which is read by a card stack reader of claim 3 wherein the read code is recorded to the card with a fluorescent material that generates an infrared light ray by irradiation with an excited light.

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9. A card which is read by a card stack reader of claim 3 wherein the read code is recorded to the card with a fluorescent material that generates a light ray, having a wavelength longer than a wavelength of a blue light, by irradiation with an excited light.

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10. A card which read by a card stack reader of any of claims 1 to 3 wherein the read code recorded to the card includes guide bits.

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11. A card stack reader according to claim 3 wherein the card stack reader further comprises a dichroic mirror reflecting the excited light emitted by the light irradiation unit such that an optical axis of the excited light and an optical axis of the imaging unit match with each other and are set to be perpendicular to the peripheral side edge of each card in the stack.

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12. A card stack reader according to claim 1 wherein the card stack reader comprises a first card holder which holds the stack of cards in an inclined condition such that the peripheral side edges of the cards are obliquely stacked, and the imaging unit is arranged to straightly confront the obliquely stacked peripheral side edges of the cards.

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13. A card stack reader according to claim 3 wherein the card

stack reader comprises:

a first switch unit switching on and off the supply of power of an external power source to one of the light irradiation unit and the imaging unit;

5 a charging/discharging unit performing charging and discharging of a supplied power;

a second switch unit switching on and off the supply of the power of the external power source to the charging/discharging unit; and

10 a third switch unit switching on and off the supply of a current discharged by the charging/discharging unit to the other of the light irradiation unit and the imaging unit.

14. A card stack reader according to claim 1 wherein the card
15 stack reader comprises a second card holder which holds the stack of cards by arranging the peripheral side edges of the cards in an aligned condition and exerts pressure on the peripheral side edges of the cards.

20 15. A card stack reader according to claim 14 wherein the second card holder cuts off an external light entering the imaging unit which is arranged to straightly confront the peripheral side edges of the cards in the stack.

25 16. A card case which contains a stack of cards read by a card stack reader of claim 1 wherein the card case includes a grooved portion that inhibits the peripheral side edges of the cards from touching the card case.

30 17. A card case according to claim 16 which contains the stack of cards read by the card stack reader wherein the card case includes a spring member which exerts pressure on the cards of the stack in a card stacking direction.

18. A card case which contains a stack of cards read by a card stack reader of claim 1 wherein the card case includes an access window provided at a position corresponding to the peripheral side portion of the stack of cards contained in the card case.

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19. A card case which contains a stack of cards read by a card stack reader of claim 1 wherein the card case comprises:

a main body in which a spring member, exerting pressure on the cards of the stack in a card stacking direction, is provided; and

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a lid member integrally connected to the main body, the lid member covering an exposed portion of the stack of cards that is not contained in the main body.

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20. A method for manufacturing a card read by a card stack reader of claim 1, the method comprising the steps of:

printing the read code to a portion of the card adjacent to a peripheral side edge of the card; and

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cutting the card along a straight line passing through the code-printed portion to form the peripheral side edge of the card where the read code is printed.

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21. A card manufacturing method according to claim 20 wherein the read code is printed to the card with a fluorescent ink which generates an infrared light or a visible light, and wherein a card graphic pattern is printed over the read code on the card with an ink that is transparent under an infrared light or a visible light.

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22. A method for manufacturing a card read by a card stack reader of claim 1 wherein the read code is directly printed on the peripheral side edge of the card.

23. A card manufacturing method according to claim 22 wherein a same read code is printed to the peripheral side edge of

each of the cards in the stack.

24. A card manufacturing method according to claim 22
wherein the read code is directly printed to the peripheral side edge
5 of the card by spraying of an ink to the peripheral side edge of the
card.

25. A card manufacturing method according to claim 23
wherein a graphic pattern is read from a surface of the card, and a
10 read code corresponding to the read graphic pattern is printed to the
card by spraying of an ink to the card.

26. A card manufacturing method according to claim 22
wherein a printing surface is formed on a front surface and a back
15 surface of the card by using an ink that cuts off or absorbs an
infrared light or a visible light, and wherein the read code is printed
to the center of the peripheral side edge of the card with a
fluorescent ink that generates an infrared light or a visible light.

20 27. A method for manufacturing a card read by a card stack
reader of claim 1, the method comprising the steps of:

forming the card with a source material containing a
fluorescent material that generates an infrared light or a visible
light; and

25 directly printing the read code to the peripheral side edge of
the card with an ink that cuts off or absorbs an infrared light or a
visible light.

28. A method for manufacturing a card read by a card stack
30 reader of claim 1, wherein a plurality of different read codes are
printed to the peripheral side edge of the card.

29. A method for manufacturing a card read by a card stack

reader of claim 1, wherein the read code at the peripheral side edge of the card recognized by the card stack reader from a front surface of the card is different from the read code recognized by the card stack reader from a back surface of the card.

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30. A method for manufacturing a card read by a card stack reader of claim 1, wherein the read code at the peripheral side edge of the card has a data pitch for encoding that varies depending on a kind of the card.

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31. A game machine which uses a card stack reader of claim 1 wherein a character or a function corresponding to a read code of each card recognized by the card stack reader is allocated to a card game.

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32. A game machine according to claim 31 wherein the game machine comprises a storage unit which stores a value of a parameter acquired in a progress of a card game by a character corresponding to the read code of the card recognized by the card stack reader and a player identification number.

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33. A game machine which uses a card stack reader of claim 1 wherein a character or a function corresponding to combinations of a plurality of read codes of the cards in the stack recognized by the card stack reader is allocated to a card game.

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34. A game machine according to claim 31 wherein the game machine is connected to a server via a network, and other game machines are connected to the server.

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35. A card stack reader according to claim 1 wherein the read code is recorded to the peripheral side edge of each card with a light storage material.

36. A card which is read by a card stack reader of claim 1 wherein the read code at the peripheral side edge of the card is recorded to the card with a light storage material.

5 37. A computer-readable storage medium on which a game program is recorded, the game program causing a computer to execute a card game, the computer-readable storage medium comprising:

10 an advertisement indication detecting means for detecting whether the read code at the peripheral side edge of each card read by the card stack reader of claim 1 includes an advertisement indication; and

15 an advertisement displaying means for displaying an advertisement in a game screen when the presence of the advertisement indication is detected.

38. A card manufacturing method according to claim 23 wherein the same read code is printed to the peripheral side edge of each of the cards in the stack by using a roller.

20 39. A card case which contains a stack of cards manufactured by a card manufacturing method of claim 38, wherein the card case comprises a stopper which arranges the peripheral side edges of the cards in the stack in a flattened condition.

25 40. A card manufacturing method according to claim 38, wherein a read code including a plurality of bits is printed to the peripheral side edge of each of the cards in the stack by using a plurality of rollers.

30 41. A card stack reader according to claim 35 wherein the card stack reader comprises a flash light irradiation unit which emits a flash light to the peripheral side edge of each card so that the

emitted light is stored into the light storage material of the read code.

5 42. A card stack reader according to claim 41 wherein the
imaging unit reads an image from the peripheral side portion of the
stack of cards at a plurality of times at intervals of a given period
after the flash light is emitted by the flash light irradiation unit, and
wherein the card stack reader comprises an image comparison unit
which compares the images read by the imaging unit at the plurality
10 of times.

 43. A card which is read by a card stack reader of claim 1,
wherein the read code includes: data bits each indicating a binary
value of the read code; a front/back indication bit indicating one of
15 front and back surfaces of the card; and edge bits indicating
respective positions of a start and an end of the read code.

 44. A card according to claim 43 which is read by the card
stack reader, wherein each of the data bits, the front/back indication
20 bit and the edge bits has a predetermined width along the peripheral
side edge of the card.

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